central medullary substance. Both cells and central substance contain something resembling myeline. This myeline separates the fine varicose fibres which make up the truly nervous part of the central substance. This latter is considered as the homologue of the white matter in the vertebrates. No structure is found which corresponds with the neuroglia of the vertebrates.

There is a detailed account of the course of the fibres in the ganglia in different forms, and also several generalizations as to the function of cells from their form and arrangement. The reviewer finds the evidence inconclusive on many of the points stated above.

Zur Anatomie des Nervensystems der Gymnophionen. J. WALDSCHMIDT. Jena. Zeitschr. für Naturwissenschaft, Bd. XX, S. 461.

Under Wiedersheim's direction the author has made a study of the brain and cranial nerves in this interesting order of the amphibia, the representatives of which have rudimentary sense organs and no limbs. The olfactory division of the fore-brain is well developed, the cerebral hemispheres not remarkable, the inter-brain very poorly developed, the mid-brain undivided, the hind-brain wanting, and the after-brain moderate. The pineal gland is very rudimentary. Of the cranial nerves down to the tenth, the second is rudimentary, corresponding with the very poorly developed eyes; the fourth and sixth cannot be found, and the eighth, if represented at all, is only present as the merest rudiment, corresponding with the absence of any auditory mechanism. The chief interest centres in the first pair. There are two roots from each olfactory lobe, a ventral and dorsal. The former is best developed. In the opinion of W. the ventral represents the pair usually found in the vertebrates, while the dorsal roots have been secondarily acquired by this order, which is practically reduced to this single special sense of smell. The condition of the parietal eye as indicated by the very rudimentary state of the pineal gland and the absence of any parietal foramen, is also a point of interest.

Do the Nervi Erigentes leave the Spinal Cord in Anterior or Posterior Roots? GASKELL. Proceed. of the Physiological Society, 1887, No. 1, p. 4. The Journal of Physiol. VIII, 1.

Opinion on this point has been divided. The author stimulated the peripheral portions of the sacral nerve roots in six rabbits. The anterior roots of the second and third sacral nerves caused an erection when stimulated. The stimulation of the posterior roots produced no effect. The inference drawn is that vaso-dilator fibres are to be looked for in the anterior nerve roots.

Zur Anatomie des Froschgehirns. M. KOEPPEN. Neurolog. Centralbl. No. 1, 1888.

In Schwalbe's laboratory and under his direction the author has studied the normal anatomy of the frog's brain by Weigert's haematoxylin method and carmine staining. In the preliminary account here presented the principal results are summarized. The vagus, trigeminus, and acusticus all have large ascending roots, which in the case of the vagus and trigeminus are double. The main ascending root for the vagus is in the lateral column, almost the entire column being used in this way, while for the trigeminus it lies in

the dorsal column; the minor ascending root for these two nerves is found in the dorsal cornua. The acusticus has a three-fold origin, (1) general nuclear mass at that level; (2) from large cells which are the representative of the nucleus of Deiters; (3) from a round nucleus in the dorsal part of the gray matter. The large cells stand in connection with the roots of the acusticus on the one hand, the root fibres being large, and on the other appear to connect with the largest fibres in the cord, these latter running in the ventral columns and entering the ventral nerve roots. This is supposed to represent part of the mechanism for the equilibrium centre. Fibres lying in much the same position as Mauthner's fibres in the fish are found and homologized with the posterior longitudinal bundle. There are no uninterrupted tracts to the fore-brain, and there is nothing corresponding to a pyramidal tract. There is a well developed ventral commissure, an inferior olive, and the system of fibres in the fore-brain is complicated, but the individual fibres are not brought out by haematoxylin. K. confirms the existence of a corpus callosum. The olfactory nerves start from masses of fibres in the glomeruli, there being no cells in these glomeruli, and the olfactory nerves are partially crossed.

Ueber die hinteren Nervenwurzeln, ihre Endigung in der grauen Substanz des Rückenmarkes und ihre centrale Fortsetzung im Letzteren. BECHTEREW. His. und Braune's Archiv, 1887, No. 2 u. 3, S. 126.

The author investigated the foetal cord in man. He distinguishes two groups of fibres entering by the posterior nerve roots: one, early medullated (about the fifth month) with fibres of large caliber and lying mesial, the other becoming medullated later, with fibres of small size and lying lateral. The former appear on entering the cord to run mainly to the ventral portion of the column of Burdach, the latter goes chiefly to the most posterior part of the lateral column, the marginal zone (Randzone) of Lissauer. Both groups send small portions directly into the gelatinous substance. After a longer or shorter course all the fibres of the posterior roots enter the gray matter. There are no root fibres which pass directly to the oblongata. The following is the central course of the two components of the posterior nerve roots. The fibres of the mesial bundle pass in several directions after entering the gray matter; one part goes to the column of Clarke, another to the anterior cornu of the same side, to there unite with the cells; and a third to the anterior cornu of the other side, passing through the anterior commissure. The fibres of the lateral bundle pass cephalad for a distance in the marginal zone, then end into the small cells in the posterior cornu. From the column of Clarke there pass out fibres to the direct lateral cerebellar tract, others to the ventral portion of the column of Burdach and in part to the column of Goll, and finally bundles to the anterior cornu of the same side, and through the anterior commissure to the anterior cornu of the opposite side. From the small cells in the posterior cornu pass fibres to the limiting layer (Grenzschicht) and to the column of Goll. In the foetal cord the posterior commissure does not contain any medullated fibres. From these anatomical observations the author draws several physiological inferences which are here passed over.